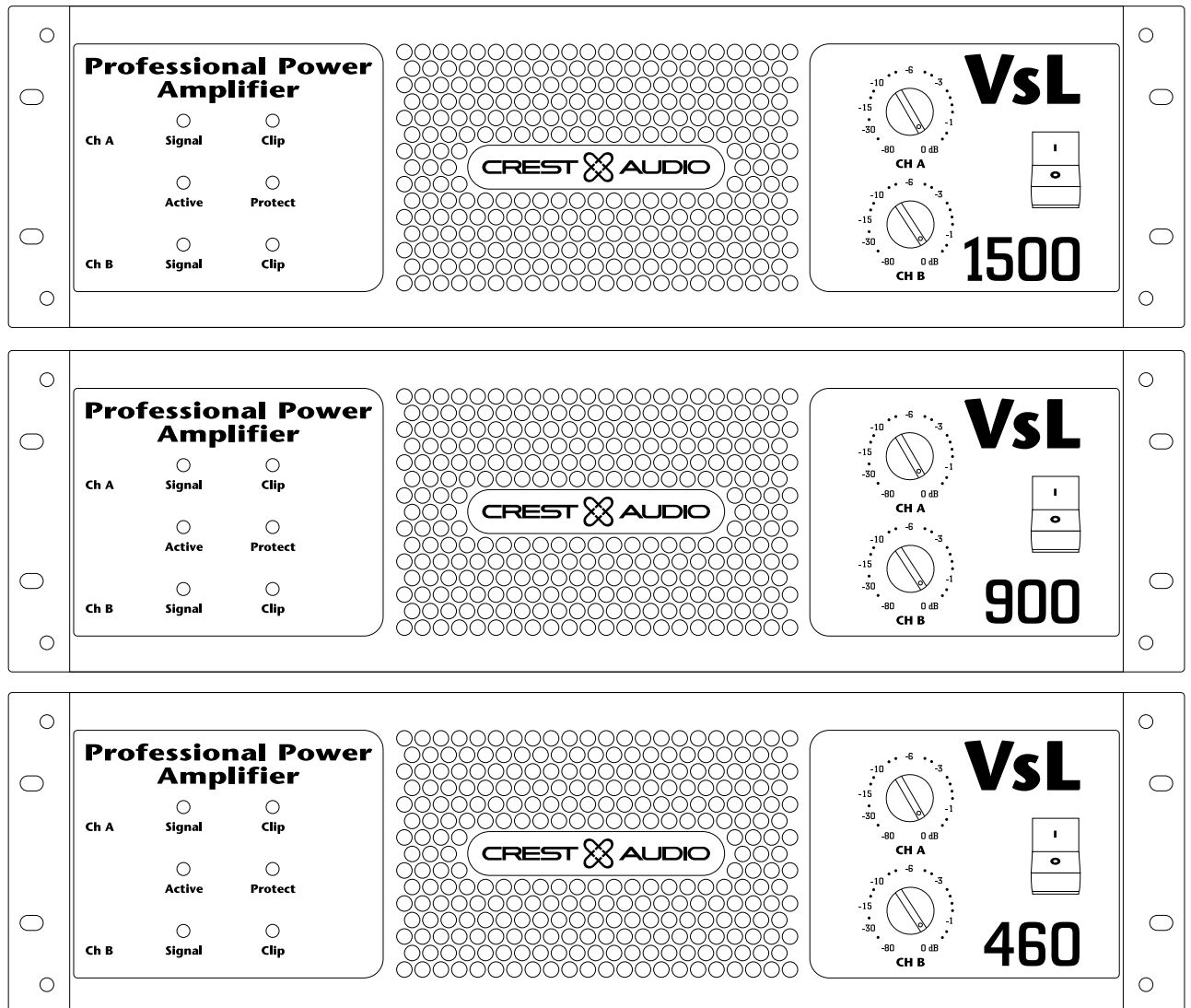




PROFESSIONAL POWER AMPLIFIERS



OWNER'S MANUAL

Important Precautions



This symbol is used to alert the operator to follow important operating procedures and precautions detailed in documentation.



This symbol is used to warn operators that uninsulated "dangerous voltages" are present within the equipment enclosure that may pose a risk of electric shock.

1. **Save the carton and packing material even if the equipment has arrived in good condition.** Should you ever need to ship the unit, use only the original factory packing.
2. **Read all documentation before operating your equipment.** Retain all documentation for future reference.
3. **Follow all instructions** printed on unit chassis for proper operation.
4. **Do not spill water or other liquids into or on the unit,** or operate the unit while standing in liquid.
5. **Make sure power outlets conform to the power requirements** listed on the back of the unit.
6. **Do not use the unit if the electrical power cord is frayed or broken.** The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
7. **Always operate the unit with the AC ground wire connected** to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
8. **Mains voltage must be correct and the same as that printed on the rear of the unit.** Damage caused by connection to improper AC voltage is not covered by any warranty.
9. **Have gain controls on amplifiers turned down during power-up** to prevent speaker damage if there are high signal levels at the inputs.
10. **Power down & disconnect units from mains voltage before making connections.**
11. **Never hold a power switch in the "ON" position if it won't stay there itself!**
12. **Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.**
13. **Do not block fan intake or exhaust ports.** Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, weathersheet, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of foreign matter.
14. **Do not remove the cover.** Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
15. **Connecting amplifier outputs to oscilloscopes or other test equipment** while the amplifier is in bridged mode may damage both the amplifier and test equipment!
16. **Do not drive the inputs with a signal level greater than that required to drive equipment to full output.**
17. **Do not connect the inputs / outputs of amplifiers or consoles to any other voltage source,** such as a battery, mains source, or power supply, regardless of whether the amplifier or console is turned on or off.
18. **Do not run the output of any amplifier channel back into another channel's input. Do not parallel- or series-connect an amplifier output with any other amplifier output.** Acoustic is not responsible for damage to loudspeakers for any reason.
19. **Do not ground any red ("hot") terminal. Never connect a "hot" (red) output to ground or to another "hot" (red) output!**
20. **Non-use periods.** The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
21. **Service Information**
Equipment should be serviced by qualified service personnel when:
A. The power supply cord or the plug has been damaged;
B. Objects have fallen, or liquid has been spilled into the equipment;
C. The equipment has been exposed to rain;
D. The equipment does not appear to operate normally, or exhibits a marked change in performance;
E. The equipment has been dropped, or the enclosure damaged.
22. To obtain service, contact your nearest Service Center, Distributor, Dealer, or Crest Audio Customer Service directly at:

Crest Audio Inc.
100 Eisenhower Drive
Paramus NJ 07652
tel 201.909.8700
fax 201.909.8744
<http://www.crestaudio.com>

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Introduction

Congratulations on your purchase of a Crest Audio power amplifier. Please read this manual carefully (and the accompanying "Important Precautions" pamphlet) as it contains information vital to the safe operation of your amplifier.

Your VsL Series amplifier represents a major step forward in power amplifier technology and design. It is feature-packed and engineered for value.

All VsL Series models include advanced circuitry capable of providing outstanding reliability and sonic performance, while protection circuitry safeguards your speakers and the amp itself. Built to Crest Audio's exacting standards from high quality components, VsL Series amplifiers are ideally suited to the most punishing sound reinforcement applications - fixed or mobile.

Unpacking

Upon unpacking, inspect the amplifier. If you find any damage, notify your dealer immediately. Only the consignee may institute a claim with the carrier for damage incurred during shipping. Be sure to save the carton and all packing materials for the carrier's inspection. It is a good idea to save the carton and packing material even if the amplifier has arrived in good condition. Should you ever need to ship the unit back to Crest Audio, one of its offices, or service centers, use only the original factory packing.

Installation and Mounting

All VsL Series amplifiers are 3-rack space units that can mount in a standard 19-inch rack. Four front panel mounting holes are provided. Rear mounting ears give additional support, especially important in mobile sound systems. Because of the cables and connectors on the rear panel, a right-angle or offset screwdriver or hex key will make it easier to fasten the rear mounting ears to the rails. Optional rack-mount handles are available from your Crest Audio authorized dealer.

Front Panel Controls

1. Rack Mounting Ears.

Two front panel mounting holes are provided on each mounting ear.

2. Signal LED.

Each channel has a signal LED. This LED comes on when the input signal entering the amplifier channel is being amplified.

3. Active LED.

The green Active LED indicates the amplifier is turned on.

4. Protect LED.

If either channel is in Protect mode, this LED will light.

5. Clip LEDs.

Each channel has a clip LED. This LED comes on at clipping point, and indicates that ACL (Active Clip Limiting) is engaged.

6. Fan Intake Grill.

A 110 CFM fan mounted behind the fan intake grill draws cooling air into the amplifier. Do not block this intake!

7. Input Attenuators.

Two front-panel input attenuators adjust level for their respective amplifier channels. Minimum attenuation (0dB) equals maximum output. In the bridged mode, both attenuators are used to control signal level; in addition, both must be at the same setting.

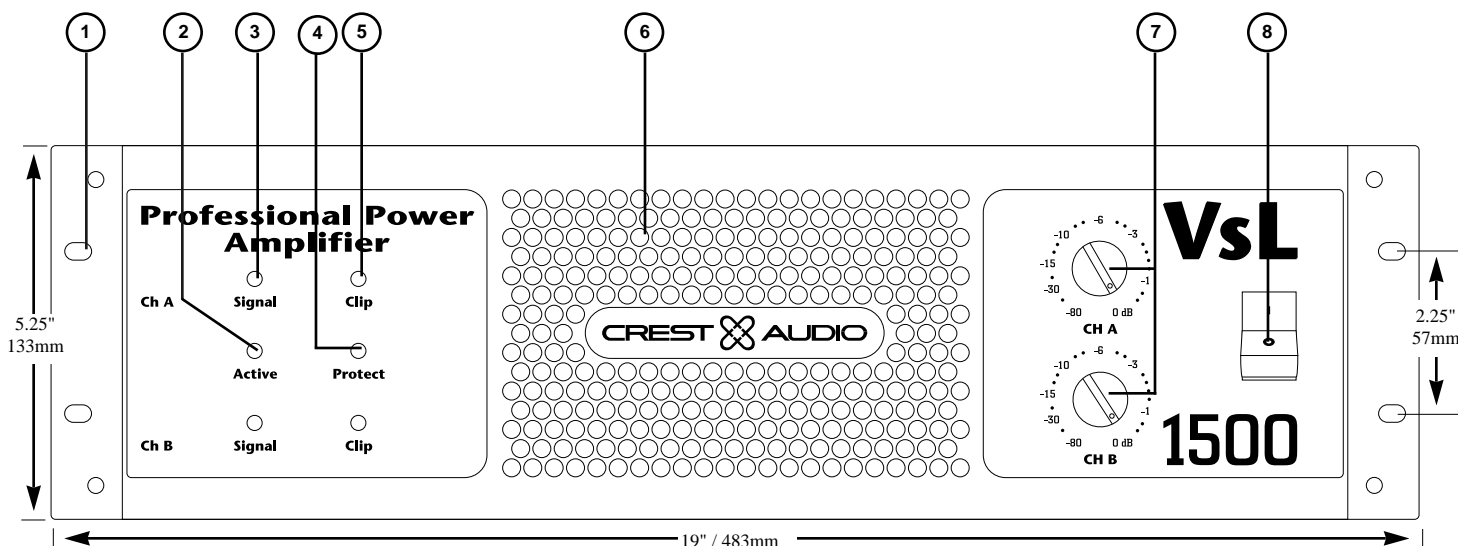
8. AC Power Switch/Circuit Breaker.

VsL Series amplifiers have a combination AC switch/circuit breaker on the front panel. If the switch shuts off during normal use, push it back to the "ON" position once. If it will not stay on, the amplifier needs servicing. No fuses are used.

9. Fan Exhaust Ports.

Heated air exits the amplifier through the fan exhaust ports, located on the sides of the amplifier chassis. Be sure not to block these ports, especially when rack-mounting the amplifier.

Front Panel Diagram



Rear Panel Controls and Connections

11. 5-Way Output Binding Post Connectors.

For connection with bare wire, banana plug or spade lug output connections. Connection is made either to the Channel A and Channel B terminals (Stereo Mode), or across the red ("hot") terminals only of Channels A and B (Bridge Mode). See the "Operation" Section for more information.

12. Balanced Barrier Strip Input Connectors.

For connection of bare wire cable or spade lug connectors. *Note: When connecting unbalanced inputs to the Barrier Strip inputs, make sure to jumper the negative terminal to the ground terminal. Otherwise, a 6 dB drop in signal level will result. See drawings 6 & 7 for diagrams detailing Input Barrier Strip connections.*

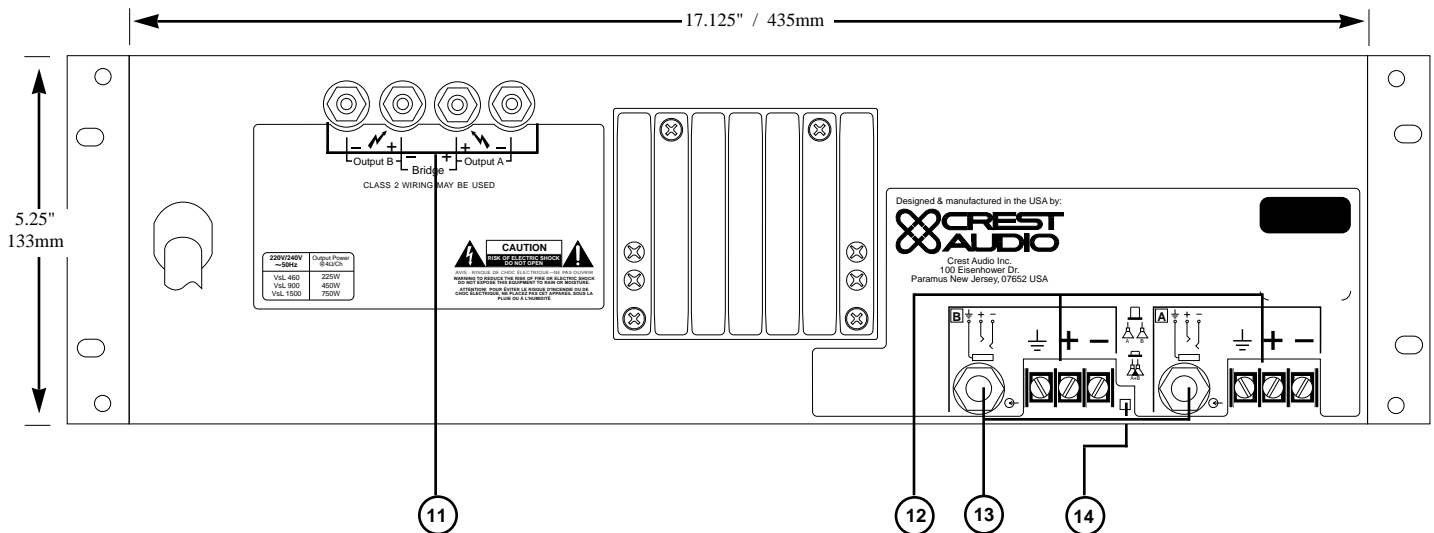
13. Balanced TRS (1/4") Connectors.

For connection of balanced TRS Input Plugs. A diagram showing TRS polarity is shown on drawing 4. *Note: Unbalanced "Tip/Sleeve" plugs may be used with the balanced TRS connectors. The "ring" terminal or negative input will be connected to ground internally.*

14. Mode Selection Switch.

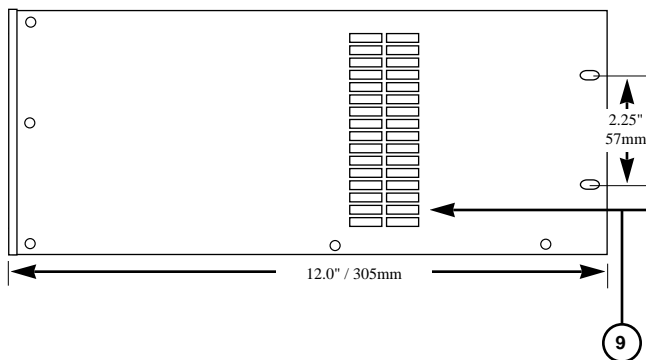
This push-button switch configures the amplifier for either Stereo or Bridged Mono operation mode. Amplifiers are factory-configured for Stereo Mode. See the "Operation" Section for more information.

Rear Panel Diagram

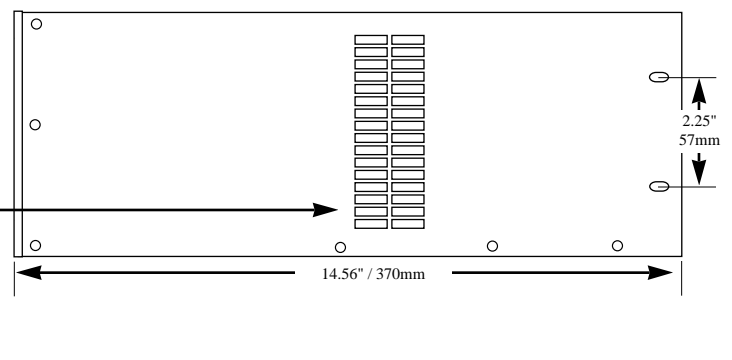


Side Dimensions

VsL460, VsL900



VsL1500



Operation

Connecting Power / Circuit Size Requirements.

VsL Series amplifier power requirements are rated at “idle”, 1/8th power (“typical” music conditions), 1/3rd power (“continuous” music conditions), and maximum rated power. The maximum power current draw rating is limited only by the front panel circuit breaker. Consult the specifications at the end of this manual for the “typical” current that each amplifier will demand. Mains voltage must also be correct and the same as that printed on the rear of the amplifier. Damage caused by connecting the amplifier to improper AC voltage is not covered by any warranty. *Note: Always turn off and disconnect the amplifier from mains voltage before making audio connections, and as an extra precaution, have the attenuators turned down during power-up.*

Cooling Requirements.

VsL Series amplifiers use a forced-air cooling system to maintain a low, even operating temperature. Drawn by a two-speed fan mounted behind the front panel, air enters through the front grill and courses through the cooling fins of the heat sink, which dissipates power transistor heat, before exiting through the side panel ports. Make sure that there is enough space around the front of the amplifier to allow air to enter, and around the sides of the amp to allow the heated air to exit. If the amp is rack-mounted, do not use doors or covers on the front of the rack; the exhaust air must flow without resistance. *Note: Whatever type of rack you are using, make sure that the heated air can escape freely, and that there is no resistance to the intake of cool air through the front grill.*

Mode Selection.

The push-button Mode Select switch (located on the rear panel between input connections for Channels A and B) configures the amplifier for either Stereo Mode or Bridged Mono Mode. Amplifiers are factory-configured for Stereo Mode. To bridge the amplifier, turn it off, and push the mode selection switch to the “bridge” position. Signal is applied to Channel A’s input only. Both attenuators are used to control signal level; in addition, both must be set at the same setting. See the drawings on pages 6 & 7 for essential connection information.

Stereo Mode.

(Drawing 1) In Stereo Mode, both channels operate independently, with their input attenuators controlling their respective levels. Signal at Channel A’s input produces output at Channel A’s output, while signal at Channel B’s input produces output at Channel B’s output. Recommended minimum nominal load impedance for stereo operation is 2 ohms per channel. Either the 1/4" (TRS) inputs or the barrier strip inputs may be used. Loudspeakers are connected to the red and black 5-way output binding posts for each channel.

Bridged Mono Mode.

(Drawing 2) Bridged Mono Mode straps both amplifier channels together to make a very powerful single channel monaural amplifier. One channel “pushes” and the other “pulls” equally, doubling the power over that of either channel alone. Signal is applied to Channel A’s input only. In the bridged mode, both attenuators are used to control signal level; in addition, both must be set at the same setting. Either the 1/4" (TRS) input or the barrier strip input may be used. Speakers are connected across the red “hot” (+) terminals: connect A’s terminal to the positive (+) speaker wire, and connect B’s terminal to the negative (-) speaker wire.

Note: Use extreme caution when operating the amplifier in bridged mode. Never ground either side of the speaker cable when the amplifier is in bridged mode; both sides are “hot.” If an output patch panel is used, all connections must be isolated from each other and from the panel. The recommended minimum nominal load impedance in the bridged mode is 4 ohms, which is the equivalent to driving both channels at 2 ohms. Driving bridged loads of less than the recommended minimums will activate the IGM circuitry, resulting in a loss of power, and may also cause a thermal protect condition.

Sending One Signal to Both Channels.

(Drawing 3) To send the same signal to both channels, connect the input signal to Channel A via the TRS input connector or the Input Barrier Strip. Run jumpers from the positive and negative connectors of Channel A’s Input Barrier Strip to those of Channel B’s. Both channels share the input signal, but will operate independently. Speakers are connected as in Stereo Mode. *Note: Regardless of operating mode, NEVER connect amplifier outputs together!*

Connecting Outputs.

Speakers are connected using 5-way Output Binding Post connectors. For more information, see the sections on Stereo & Bridged Mono mode and Drawings 1-3.

Connecting Inputs.

Both the barrier strip and 1/4-inch TRS input connectors accept balanced and unbalanced audio connections. *Note: When using three-pole (‘stereo’) TRS connectors to connect unbalanced signals, make sure that the ring (negative) connection is made either to the cold (-) output of the source equipment, or to ground. Unbalanced, two-pole connectors may be used without modification. In Stereo Mode, one or both channels may be used. In the Bridged Mono Mode, both outputs are driven from Channel A’s input; Channel B’s input is unused. Diagrams showing input connections can be found on pages 9 & 10.*

Protection Features.

Every model in the VsL Series incorporates protection features. Derived from Crest Audio's extensive experience with the world's largest sound rental companies, the group of circuits sets new standards in load and amplifier protection.

ACL.

(Automatic Clip Limiting). At the amplifier's full power, or clipping point, ACL will be activated. This is indicated by illumination of the ACL LED, located at the right end of the meter array. The channel gain will automatically be reduced, guarding the loudspeakers against the damaging high power, continuous square waves that would otherwise be produced. Situations that may activate ACL include: uncontrolled feedback, oscillations, or an improper equipment setting or malfunction upstream from the amplifier. Normal program transients will not trigger ACL; only steady or excessive clipping will. ACL is virtually transparent in operation and full signal bandwidth is maintained.

IGM Impedance Sensing.

IGM (Instantaneous Gain Modulation) is an innovative circuit that allows the amplifier to operate safely into loads as low as 2 ohms. When the amplifier sees a load that overstresses the output stage, the IGM circuit adjusts the channel gain to a safe level. Like ACL, the IGM circuit is inaudible in normal use. In addition, if extreme low impedance is encountered, the amplifier's output relay will open.

AutoRamp Protection.

Auto Ramp operates every time the amplifier is turned on or is reactivated after a protect condition is corrected. This exclusive Crest Audio feature gradually (-80dB to 0dB in 3.0 seconds) increases gain to the attenuator setting avoiding unnecessary stress on the loudspeakers.

Thermal Protection.

If the heatsink temperature reaches an abnormally high temperature, the amplifier will protect itself by disconnecting loudspeakers and shutting down until sufficiently cooled. During this time, the Protect LED's will light. If the power transformer gets too hot, its thermal sensing circuit will disconnect both channel outputs. During this time, the Active LED will extinguish, the Protect and ACL LEDs will stay lit, and the cooling fan will stay running at low speed. Normal operation will resume automatically once the transformer cools to a safe level.

Short Circuit.

If an output is shorted (i.e., defective speakers or crossed speaker wires) the IGM and thermal circuits will automatically protect the amplifier. The IGM circuit senses the short circuit as an extremely stressful load condition and attenuates the signal, protecting the channel's output transistors from overcurrent stress. If the short circuit remains, the load will be disconnected by the thermal protection circuitry.

DC Voltage Protection.

If an amplifier channel detects DC voltage at its output terminals, the output relay will immediately open to prevent loudspeaker damage. The Protect LEDs will light.

Subsonic Frequencies.

The VsL Series amplifiers have built-in high pass filtering to provide subsonic frequency protection for each channel. In addition, a relay will open if excessive subsonic energy appears at the output.

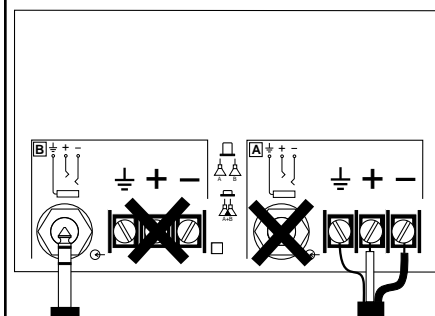
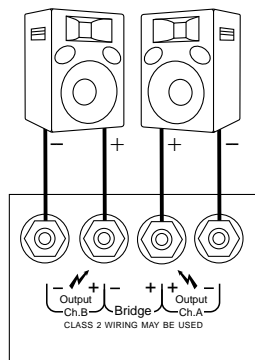
Service Information.

To obtain service, contact your nearest Service Center, Distributor, Dealer, or the Crest Audio Service Department at:

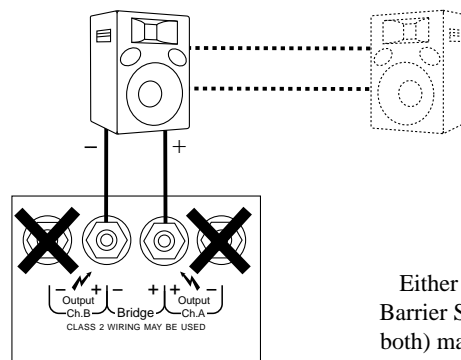
Crest Audio Inc.
100 Eisenhower Drive
Paramus NJ 07652
tel 201.909.8700
fax 201.909.8744
<http://www.crestaudio.com>

1. Stereo Mode

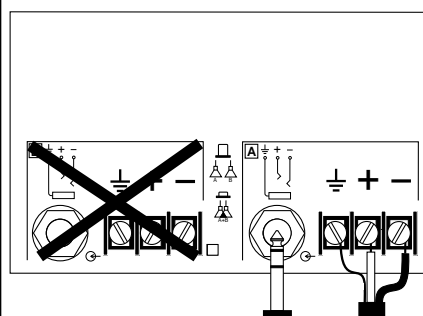
Either TRS or Input Barrier Strips (but not both) may be used for input connections to Channels A & B. In this diagram, bare wire has been connected to the Input Barrier Strip of Channel A, while a TRS plug is being connected to Channel B.



2. Bridged Mono Mode

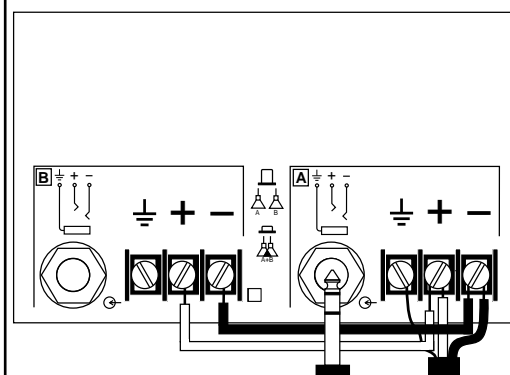
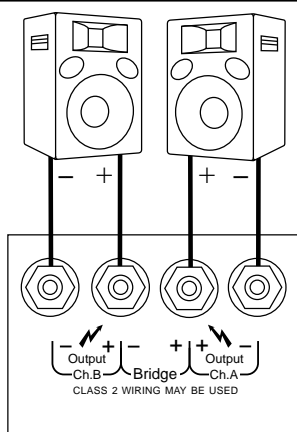


Either TRS or Input Barrier Strips (but not both) may be used for input connection to Channel A.

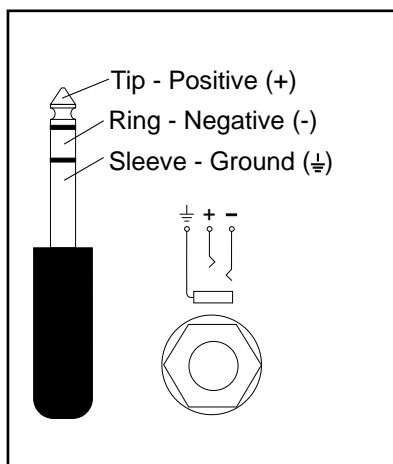


3. Parallel Mode.

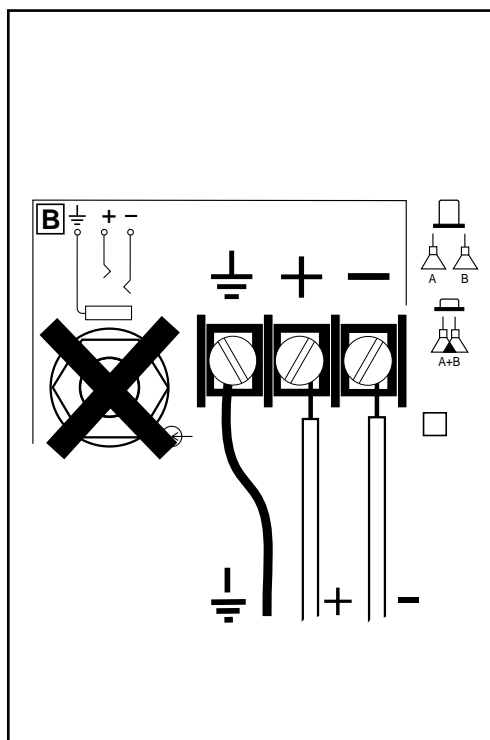
Input is connected to Channel A using either a TRS connector or the Input Barrier Strip (but not both). Jumper from Channel A to Channel B for ground is not necessary; however, input ground connection to Channel A must be made.



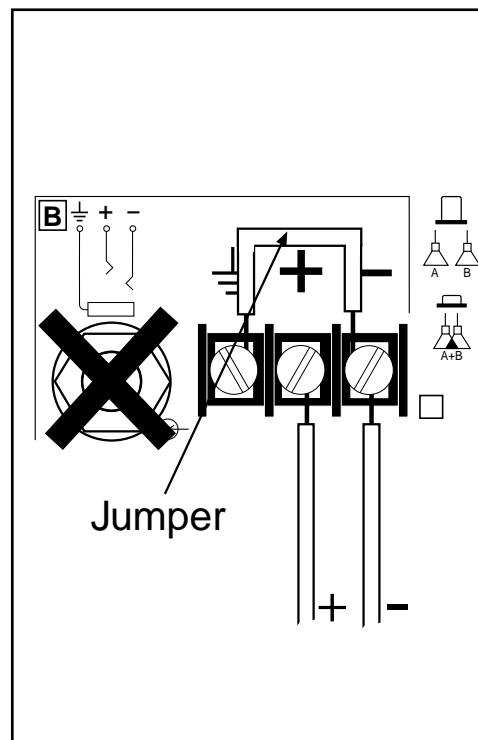
4. TRS Polarity



5. Balanced Input Connections



6. Unbalanced Input Connections



Specifications

	VsL460	VsL900	VsL1500
8Ω Stereo Power †	150 Watts	250 Watts	400 Watts
4Ω Stereo Power †	225 Watts	450 Watts	750 Watts
2Ω Stereo Power †	325 Watts	550 Watts	1000 Watts
8Ω Bridged Power †	450 Watts	900 Watts	1500 Watts
4Ω Bridged Power †	650 Watts	1100 Watts	2000 Watts
Max RMS Output Voltage (each channel)	36V	52.3V	70.7V
Peak Output Voltage (each channel)	51V	74V	100V
Frequency Response (+0/-0.3dB, 1W/8Ω)	10Hz-20kHz, -3dB @ 165kHz	10Hz-20kHz, -3dB @ 165kHz	10Hz-20kHz, -3dB @ 165kHz
Power Bandwidth (Rated power at 4Ω, 1% THD+N)	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz
TourClass Protection	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, sub/ultrasonic input.	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, sub/ultrasonic input.	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, sub/ultrasonic input.
THD+N (rated power at 4Ω, 1kHz)	<1.0%	<1.0%	<1.0%
SMPTE IMD (rated power at 8Ω, 60Hz & 7kHz)	<0.05%	<0.05%	<0.05%
Damping Factor (10-400Hz at 8Ω)	>700:1	>1000:1	>1000:1
Input CMRR (1 kHz)	> - 64dB	> - 64dB	> - 64dB
Input Sensitivity (rated power at 8Ω)	.775V	1.0 V	1.4V
Voltage Gain	X38.6	X40	X38.6
Input Impedance (balanced/unbalanced)	>20kΩ/>10kΩ	>20kΩ/>10kΩ	>20kΩ/>10kΩ
Hum & Noise ("A" weighted, full power at 4Ω)	-105 dB	-105 dB	-105 dB
Crosstalk ("A" weighted, full power at 4Ω)	> - 60 dB	> - 60 dB	> - 60 dB
Class	AB	AB	H
Input Connectors (per channel)	TRS (tip +) & Barrier Strip	TRS (tip +) & Barrier Strip	TRS (tip +) & Barrier Strip
Output Connectors (per channel)	5-way binding posts	5-way binding posts	5-way binding posts
Filter Storage	44,000 μF	38,000 μF	50,000 μF
Power Supply (factory configured)	100V-240V, 50-60Hz	100V-240V, 50-60Hz	100V-240V, 50-60Hz
Idle Current Draw (120V)	1.0A	2.8A	1.8A
1/8 Power Curr. Draw (typical music, 120V/4Ω)	3.5A	7.2A	4.3A
1/3 Power Curr. Draw (continuous music, 120V/4Ω)	5.2A	10.4A	8.5A
Max Curr. Draw (circuit breaker rating, 120V/4Ω)	8.0A	15.0A	21.0A
Thermal Emissions (1/8 Power, 4Ω)	1300 BTU/hr	2000 BTU/hr	3100 BTU/hr
Thermal Emissions (1/3 Power, 4Ω)	1530 BTU/hr	2900 BTU/hr	4400 BTU/hr
Cooling	Front to Side, one 110 CFM, 2-Speed fan	Front to Side, one 110 CFM, 2-Speed fan	Front to Side, one 110 CFM, 2-Speed fan
Controls	Front Panel: 2 attenuators, magnetic circuit breaker/power switch. Rear Panel: mode select switch.	Front Panel: 2 attenuators, magnetic circuit breaker/power switch. Rear Panel: mode select switch.	Front Panel: 2 attenuators, magnetic circuit breaker/power switch. Rear Panel: mode select switch.
LED Indicators (per channel)	1 Clip, 1 Signal per channel, Protect, Active	1 Clip, 1 Signal per channel, Protect, Active	1 Clip, 1 Signal per channel, Protect, Active
Construction	14 gauge steel	14 gauge steel	14 gauge steel
Dimensions (Height x Width x Depth to rear rack ears)	5.25" x 19" x 12" / 133 x 483 x 305mm	5.25" x 19" x 12" / 133 x 483 x 305mm	5.25" x 19" x 13.33" / 133 x 483 x 339mm
Gross Weight, Net Weight	38 lbs. / 17.3 kg., 36 lbs. / 16.3 kg.	46 lbs. / 20.9 kg., 44 lbs. / 20.0 kg.	49 lbs. / 22.2 kg., 46 lbs. / 20.9 kg.

† Power figures are watts per channel, both channels driven, 1kHz, 1% THD. ♦ Approximate Values § Limited by Circuit Breaker ‡ Active Clip Limiting.
Crest Audio reserves the right to make improvements in manufacturing or design which may affect specifications. ©1997 Crest Audio Inc. 8/28/97



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